

## Claims

- [c1] A dielectrophoretic display comprising:  
a substrate having walls defining at least one cavity, the cavity having a viewing surface and a side wall inclined to the viewing surface;  
a suspending fluid contained within the cavity;  
a plurality of at least one type of particle suspended within the suspending fluid; and  
means for applying to the substrate an electric field effective to cause dielectrophoretic movement of the particles to the side wall of the cavity.
- [c2] A dielectrophoretic display according to claim 1 wherein the suspending fluid is substantially uncolored, and has suspended therein only a single type of particle.
- [c3] A dielectrophoretic display according to claim 1 wherein at least some of the at least one type of particle are electrically charged.
- [c4] A dielectrophoretic display according to claim 3 wherein the suspending fluid has suspended therein a first type of particle having a first optical characteristic and a first electrophoretic mobility, and a second type of particle having a second optical characteristic different from the first optical characteristic and a second electrophoretic mobility different from the first electrophoretic mobility.
- [c5] A dielectrophoretic display according to claim 4 wherein the first and second electrophoretic mobilities differ in sign, so that the first and second types of particles move in opposed directions in an electric field.
- [c6] A dielectrophoretic display according to claim 4 wherein the suspending fluid is substantially uncolored.
- [c7] A dielectrophoretic display according to claim 4 further comprising a backing member disposed on the opposed side of the cavity from the viewing surface, at least part of the backing member having a third optical characteristic different from the first and second optical characteristics.
- [c8] A dielectrophoretic display according to claim 7 wherein the backing member

comprises areas having third and fourth optical characteristics different from each other and from the first and second optical characteristics.

[c9] A dielectrophoretic display according to claim 7 wherein the backing member comprises areas having red, green and blue or yellow, cyan and magenta colors.

[c10] A dielectrophoretic display according to claim 7 wherein the first and second optical characteristics comprise black and white colors.

[c11] A dielectrophoretic display according to claim 1 wherein the cavity has a non-circular cross-section as seen from the viewing surface.

[c12] A dielectrophoretic display according to claim 11 wherein the cavity has a polygonal cross-section as seen from the viewing surface.

[c13] A dielectrophoretic display according to claim 1 wherein the at least one type of particle is formed from an electrically conductive material.

[c14] A dielectrophoretic display according to claim 13 wherein the at least one type of particle is formed from a metal or carbon black.

[c15] A dielectrophoretic display according to claim 1 wherein the at least one type of particle is formed from a doped semiconductor.

[c16] A dielectrophoretic display according to claim 1 wherein the substrate comprises at least one capsule wall so that the dielectrophoretic display comprises at least one capsule.

[c17] A dielectrophoretic display according to claim 16 comprising a plurality of capsules, the capsules being arranged in a single layer.

[c18] A dielectrophoretic display according to claim 1 wherein the substrate comprises a continuous phase surrounding a plurality of discrete droplets of the suspending fluid having the at least one type of particle suspended therein.

[c19] A dielectrophoretic display according to claim 1 wherein the substrate comprises a substantially rigid material having the at least one cavity formed therein, the substrate further comprising at least one cover member closing the

at least one cavity.

- [c20] A process for operating a dielectrophoretic display, the process comprising:  
providing a substrate having walls defining at least one cavity, the cavity having a viewing surface and a side wall inclined to the viewing surface; a suspending fluid contained within the cavity; and a plurality of at least one type of particle suspended within the suspending fluid; and  
applying to the substrate an electric field effective to cause dielectrophoretic movement of the particles to the side wall of the cavity.
- [c21] A process according to claim 20 wherein the electric field is an alternating electric field.
- [c22] A process according to claim 20 wherein at least some of the at least one type of particle are electrically charged.
- [c23] A process according to claim 22 wherein the suspending fluid has suspended therein a first type of particle having a first optical characteristic and a first electrophoretic mobility, and a second type of particle having a second optical characteristic different from the first optical characteristic and a second electrophoretic mobility different from the first electrophoretic mobility.
- [c24] A process according to claim 23 wherein the first and second electrophoretic mobilities differ in sign, so that the first and second types of particles move in opposed directions in an electric field.
- [c25] A process according to claim 24 further comprising:  
applying an electric field of a first polarity to the cavity, thereby causing the first type of particles to approach the viewing surface and the cavity to display the first optical characteristic at the viewing surface; and  
applying an electric field of a polarity opposite to the first polarity to the cavity, thereby causing the second type of particles to approach the viewing surface and the cavity to display the second optical characteristic at the viewing surface.
- [c26] A process according to claim 23 further comprising providing a backing member disposed on the opposed side of the cavity from the viewing surface, at

least part of the backing member having a third optical characteristic different from the first and second optical characteristics.

[c27] A process according to claim 26 wherein the backing member comprises areas having third and fourth optical characteristic different from each other and from the first and second optical characteristics.

[c28] A process according to claim 20 wherein the at least one type of particle is formed from an electrically conductive material.

[c29] A process according to claim 28 wherein the at least one type of particle is formed from a metal or carbon black.

[c30] A process according to claim 28 wherein the at least one type of particle is formed from a doped semiconductor.

[c31] A process according to claim 20 wherein the substrate comprises at least one capsule wall so that the dielectrophoretic display comprises at least one capsule.

[c32] A process according to claim 20 wherein the substrate comprises a plurality of capsules, the capsules being arranged in a single layer.

[c33] A process according to claim 20 wherein the substrate comprises a continuous phase surrounding a plurality of discrete droplets of the suspending fluid having the at least one type of particle suspended therein.

[c34] A process according to claim 20 wherein the substrate comprises a substantially rigid material having the at least one cavity formed therein, the substrate further comprising at least one cover member closing the at least one cavity.